REMARKS

In the Office Action, the Examiner objected to the drawings as not showing the subject matter of claim 7 (curved reflective surfaces). The Examiner also objected to claim 7 under 35 USC 112 and noted a typographical error therein. Applicants have cancelled claim 7 so these rejections can be withdrawn.

In the Office Action, the Examiner noted a typographical error on page 23 of the specification. This error has been corrected.

Applicants have also cancelled all the independent claims other than claim 3. Non-elected dependent claims 11 to 20 remain in the application. In the event that a claim is allowed, Applicants propose to change the dependency of the remaining claims to ultimately depend upon an allowed claim.

In the Office Action, the Examiner rejected claims 2, 4, 6 and 9 as being anticipated by the Kodera patent (5,695,602). The Examiner also rejected claims 3, 7 and 8 as being obvious based on the Kodera patent in view of the Ledger patent (5,291,269).

Applicants' invention, as defined by amended claim 3, relates to a semiconductor processing device including a wafer process station and an integrated metrology station. The metrology station is not directly part of the process station, but is coupled thereto. A transport system is provided to transfer wafers between the process station and the metrology station.

In accordance with the subject invention, the metrology station includes a broadband light source for emitting both visible and UV wavelengths. Examples of such light sources include one or more lamps such as Xenon lamps, tungsten lamps and deuterium lamps (see specification, page 8, line 13+). Optics are providing for directing the light to illuminate a region of the surface of the wafer and for collecting light reflected from the surface. A portion of the reflected light is measured by a spectrograph. The spectrograph is intended to generate a spectrum and measure the relative spectral content of the reflected light. This information can then be used to evaluate the sample.

In the Office Action, the Examiner relied on the Kodera patent to teach wafer metrology with an ultraviolet light source. The thickness measurement unit 30 of Kodera is a single wavelength system. In Kodera, the semiconductor is illuminated with a ray of light which can fall within a range covering both visible and ultraviolet light (between 200nm to 800nm). However, the patent only discusses illuminating the wafer with a single ray. There is no

discussion in Kodera of the light source and no discussion of a spectral analysis. In contrast, Applicants' invention includes a light source emitting a range of wavelengths, including both the UV and visible light. Such a light source can be defined by one or more broadband lamps of the type disclosed in the subject specification. In addition, Applicants' device further includes a spectrograph for evaluating the reflected spectrum of the light. Such a broad band analysis can provide significantly more information than a single wavelength system.

In the Office Action, the Examiner relied on the patent to Ledger for teaching a "prism spectrograph". This term appears at column 1, line 63 of Ledger in the context of a prior art discussion. More specifically, the prior art is described as a metrology system wherein the sample is illuminated with **monochromatic** light. A grating or prism spectrograph is used to measure the surface spectral reflectance. It is unclear exactly how this spectrograph is being used since the illuminating light is monochromatic, but it is apparent that the prior art system referred to in Ledger is unlike Applicants' claimed invention where the sample is illuminated with broadband light and the spectrograph is used to measure a full reflected spectrum. It should also be noted that there is no spectrograph in the actual disclosed invention of the Ledger patent. Rather, polychromatic light is selectively transmitted though filters 38 to create monochromatic light beams that illuminate a CCD camera detector array 31. Interference fringes of the type shown in Figures 5 to 7 of Ledger are analyzed. Interference fringes are characteristic of monochromatic detection.

In view of the above, it is respectfully submitted that neither Kodera nor Ledger teach or suggest Applicants' invention as defined by amended independent claim 3 which provides for a metrology station integrated with a process station and wherein the metrology station includes a light source generating light having a wavelength range across the visible and ultraviolet ranges

and a spectrograph for measuring the reflected light spectrum in order to evaluate the sample. Accordingly, it is believed that amended claim 3 defines patentable subject matter and allowance thereof is respectfully requested.

Respectfully submitted,

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MARKED UP VERSION SHOWING CHANGES

IN THE SPECIFICATION

FIG. 9 shows a preferred embodiment integrated with a wafer process station in a fabrication line. For purposes of illustration and not limitation, the process station in the embodiment in [FIG. 27] FIG. 9 is a polisher. A polishing machine 1 and an integrated surface metrology station, ISMS 10, are shown. The polishing machine 1 comprises a polishing unit 14, loading areas 18 and transport system 22. In addition, wafers 16 in carriers 18 are shown. As shown in [FIG. 27] FIG. 9, the metrology station is apart from the process station and coupled to the process station.

IN THE CLAIMS

3. (Amended) A semiconductor processing device comprising:

a wafer process station; and

a metrology station apart from but coupled to the process station wherein the metrology station comprises [an ultraviolet light source illuminating a measurement region of a surface and at leas one]:

a light source defined by at least one lamp, said light source emitting a range of wavelengths, said range of wavelengths including visible and ultraviolet light;

optics directing light from the light source to the wafer to illuminate a region of the surface thereof and for collecting light reflected from the surface;

a spectrograph [optically coupled to the measurement region of the surface] for monitoring the spectral content of the collected reflected light; and

a transport system for moving wafers between the process station and the metrology station.

--22. (New) A device as recited in claim 3, wherein the optics includes a single objective lens assembly and wherein the light from the light source, including wavelengths in both the visible and ultraviolet range are focused and collected by said single objective lens.--

--23. (New) A device as recited in claim 22 wherein said objective lens assembly is movable and can be scanned with respect to the wafer surface.--